which are now considered necessary to have any influence on the home life and habits of people shows that a much higher standard has been reached. The work carried on at the polytechnics will bear good fruit, and it is to be hoped that the London County Council will see its way clear to provide the means so that the polytechnics of London may furnish an example to every town in the United Kingdom and in all parts of the world.

THE fifteenth annual general meeting of the Association of Technical Institutions was held on Friday and Saturday last at the hall of the Drapers' Company. Sir Horace Plunkett, the retiring president, occupied the chair during the early part of the proceedings, and was succeeded by Sir Norman Lockyer, K.C.B., who was unanimously elected president for the ensuing year. Sir Norman Lockyer in his address referred to the progress that has taken place in educational methods in recent years, but pointed out that there is a lack of coordination between primary and secondary schools or technical schools. We have now a good system of elementary education, but there is a terrible wastage after the primary school. He pleaded for a fuller recognition of continuity in education and of the high standing of technical institutions in an organic system. At the second day's meeting there was a discussion on trade or craft schools, and eventually the following resolution was adopted:—"That this association, fully recognising the necessity for a comprehensive and graded scheme of technical education, embracing all sections of the community, request the council to make an inquiry with a view to ascertaining the best conditions for the development of technical education in relation to the training of workmen." In opening the discussion, Prof. W. M. Gardner, of Bradford, said that of 1000 boys passing through elementary schools, and ultimately taking positions as industrial workmen, foremen, or managers, probably not more than forty pass through a secondary school and not more than three or four attend a day technical school. The great problem is, therefore, that of the boys who leave the primary schools at thirteen and fourteen, or even earlier, and who constitute 950 out of every 1000 boys of that age. Three courses seem to be open, namely:—(1) to provide specialised technical instruction during the latter portion of the primary-school course, combining it with the general subjects in the time-table; (2) to pass the lads forward from the primary school to specially arranged trade schools for one or two years; and (3) to rely, as hitherto, on evening schools for technical instruction. How far the first plan is practicable, or even desirable, appears doubtful. It is educationally unsound to give technical instruction in a trade without first dealing with the underlying sciences in an elementary manner. The provision of special trade schools seems, the speaker said, to offer a more likely solution of the problem.

SOCIETIES AND ACADEMIES.

LONDON

Geological Society, February 5.—Sir Archibald Geikie, K.C.B., Sec.R.S., president, in the chair.—Antigorite and the Val Antigorio, with notes on other serpentines containing that mineral: Prof. T. G. **Bonney.** It is not certain that the first described specimen of antigorite was really found in the Val Antigorio. The rock probably does not occur there *in situ*, though it is found in pebbles, &c., from tributaries. Other specimens of antigorite-serpentine were described. The origin of the mineral is discussed. Pressure is essential; it can be formed from augite, and there is evidence of its coming from this mineral.—The St. David's Head "rock series" (Pembrokeshire): J. V. **Elsden.** These intrusions are of complex composition. There is a high magnesia percentage. There is no evidence of differentiation *in situ*, but the facts suggest a common origin from a differentiated magma basin. The rocks afford facilities for the study of both rhombic and monoclinic pyroxenes. Rhombic pyroxene generally crystallised earlier than the monoclinic pyroxene. There are two varieties of augite. The relation of these types lends support to the perthitic theory. The probable age of the intrusions is not greater than that of the earth movements which folded the Arenig shales in this district.

Linnean Society, February 6.—Dr. A. B. Rendle, vice-president, in the chair.—Specimens and lantern-slides of leaf impressions from the Reading beds: H. W. **Monckton** and O. A. **Shrubsole.**—Fruits and seeds from the pre-Glacial beds of Britain and the Netherlands, especially the Pakefield specimens from the neighbourhood of Lowestoft (Cromer forest bed), and from Tegelen, near Venloo, in the province of Limburg, Netherlands: Clement **Reid.**—The use of large quantities of commercial concentrated soda carbonate when boiling refractory deposits: Mrs. E. M. **Reid.**—A botanical expedition to Central Fokien: S. T. **Dunn.** In April, May, and June, 1905, a botanical expedition was undertaken, with three native collectors and one Chinese herbarium assistant, to the centre of the province of Fokien. The difficult journey from Foochow to Yenping was successfully accomplished, and enough stores deposited at that town to enable a large collection of plants to be made. The central portion of this province, which is as large as England and Wales combined, had never previously been visited by a botanist, and, as might be expected, many novelties were discovered, and are here described, amounting to at least forty new species.—Some new Alcyonaria from the Indian and Pacific Oceans: preliminary notice: Ruth M. **Harrison.**

Royal Anthropological Institute February 11.—Prof. W. Ridgeway, president, in the chair.—An additional note on New Guinea games: Dr. A. C. **Haddon.** The games were of various descriptions, and included a series of string figures.—A new instrument for determining the colour of the hair, eyes, and skin: J. **Gray.** The instrument was a simplified form of Lovibond's tintometer, by means of which hair-, eye-, and skin-colours could be classified by comparison with a series of standard coloured glasses. These standard glasses can be reproduced an indefinite number of times with the greatest precision by Lovibond's method, so that any number of observers can be provided with identical colour-scales. A series of locks of hair, arranged by the naked eye, from blonde to jet black, was exhibited, and curves showing the colour-elements of this series, as obtained by Lovibond's tintometer, were shown on the screen. The curves showed that the locks contained two coloured pigments, namely, orange and a yellow, and a black pigment. The black pigment increased uniformly in amount from blonde to black, and evidently formed the basis of the arrangement of the series by the naked eye, because the amount of orange and yellow pigment was practically constant throughout the whole series. A second series of locks of red hair was exhibited, arranged by the naked eye from light to dark red or auburn. Analysis showed that the orange pigment was predominant, and formed the basis of the classification. A diagram, exhibited to show the correlation between orange and black in the two series of locks, pointed to the conclusion that red hair was derived from dark hair by the conversion of more or less of the black pigment into an equal amount of orange pigment, while fair hair was derived from dark hair by a reduction of both the black and the orange pigments.

Institution of Mining and Metallurgy, February 20.—Prof. W. Gowland, president, in the chair.—The alloys of gold and tellurium: Dr. T. K. **Rose.** An examination of the mixtures of gold and tellurium by means of the Roberts-Austen recording pyrometer, and observing polished sections under the microscope. The main conclusions arrived at were:—(1) A compound, $AuTe_2$ or Au_2Te_4, containing 43·59 per cent. of gold, and corresponding in composition to sylvanite or calaverite, is formed when gold and tellurium are melted together in certain proportion; this compound fuses at 452°. (2) Two eutectic mixtures are formed, containing 60 per cent. and 20 per cent. of gold respectively. These alloys correspond in composition to the formulæ $AuTe$ and $AuTe_6$. Under the microscope they do not show the characteristic banded eutectic structure, but there are certain indications that they are true compounds. (3) All the alloys of gold and tellurium are brittle. (4) All those containing less than 60 per cent. of gold fuse at temperatures between 397° and 452°.—A method of settling slimes, as applied to their separation from solution in cyanide treatment: H. G. **Nichols.** The principle involved is that of removing the solid matter as it reaches the bottom of the tank in which it is settled by means of a conveyor belt. This process was found by repeated tests to give remarkable results both in the completeness of the separation effected and in the small proportion of liquid carried off by the solid matter.—Two deterrents to the dissolution of free gold in the cyanide process: Duncan **Simpson.** These deterrents are oil and lime, and the author gave examples showing their influence and the method adopted for counteracting it.—A rapid method for the estimation of arsenic in ores: H. E. **Hooper.**—The Indian mint assay of silver bullion: F. T. C. **Hughes.** A description of the methods employed in the Indian mints for the assay of the varying qualities of bullion received for coinage purposes. This process has been in vogue for upwards of fifty years, and has given satisfactory results, being specially suited to the condition of labour, &c., existing in India, and to the varied nature of the bullion operated upon.

Dublin.

Royal Dublin Society, January 21.—Prof. A. W. Conway in the chair.—The lines of flow of water in saturated soils, especially peat-mosses: L. F. **Richardson.** The author shows by means of experiments on "Bog of Allen" peat that the general velocity with which the water passes through the peat is proportional to the pressure gradient, and by utilising this fact he deduces the differential equations for the flow of water through peat saturated with water, neglecting capillarity, and assuming the peat to be isotropic in order to facilitate the mathematical treatment of the problem. The differential equations are solved by a freehand graphic method, and the form of the saturated water surface. determined, when the tubes of flow are somewhat horizontal. From the diagrams thus obtained it is possible to calculate in a simple manner—the rainfall being given—how far apart drains must be cut in a bog so as to remove just the right amount of water, and conversely what will be the effect of a given cutting. The paper concludes with the description of another method for determining the conductivity of peat for water.—A simple form of apparatus for observing the rate of absorption of oxygen by polluted waters and by other fermenting liquids: Dr. W. E. **Adeney.**

Edinburgh

Royal Society, February 3.—Prof. Andrew Gray, F.R.S., vice-president, in the chair.—Sensitive state induced in magnetic materials by thermal treatment: J. G. **Gray** and A. D. **Ross.** When steel is cooled from a high temperature, the first measured susceptibility in a given field is much higher than later measured values after the specimen has been subjected to cyclic magnetisations. This phenomenon, first noticed by Ewing, was studied in detail for steel, cast iron, cobalt, and soft iron. In soft iron the phenomenon is absent or present only to a small degree. In certain specimens of steel the effect was induced to a slight degree when the substance was raised to as low a temperature as 100° C. and then cooled; it increased with increased temperatures to about 700° C., but further increase of temperature had little influence. Mechanical vibrations considerably reduced the effect. The phenomenon was most marked in fields which gave large values of the susceptibility, tending to zero as the saturation point was approached.—The growth and development of the limbs of the penguin: Dr. D. **Waterston** and A. C. **Geddes.** The material had been brought home by Dr. W. S. Bruce, leader of the Scottish Antarctic Expedition. A comparison of the stages of development with the corresponding stages of development of the chick of a duck showed that the limbs of the penguin began at a fairly early stage to diverge in mode of growth from those of the duck, indicating that the adaptation of the fore-limbs for swimming purposes did not imply a degeneration from a form suitable for flight.

Paris.

Academy of Sciences, February 17.—M. H. Becquerel in the chair.—The properties of pure starch: L. **Maquenne.** Referring to a note by M. Fouard at the last meeting of the academy on the isolation of a new soluble form of starch, the author points out that this soluble starch is in all respects identical with that described by him, in conjunction with M. Roux, in the *Comptes rendus* two years ago. The name amylose was given to this soluble form of starch, and ordinary starch solution consists of a clear solution of amylose thickened with amylopectose.—Isotonic solutions and isoosmotic solutions: Yves **Delage.** A continuation of the controversy with J. Loeb. The author concludes that it is impossible to doubt that the parthenogenesis of the eggs of the sea-urchin can be brought about in solution isotonic with sea-water.—The visibility of Saturn's ring on the side not lighted by the sun, and its reappearance in January, 1908: M. **Amann.** A detailed account of the appearances presented by the ring between October 4, 1907, and January 14, 1908.—The relation between flying shadows and scintillation: Cl. **Rozet.** A definite relation has been established between the shadow bands and the phenomenon of scintillation. The effects have been observed, not only with the sun, but also with Venus, Jupiter, Mars, and some stars of the first magnitude.—A theorem in the theory of integral equations: E. **Goursat.**—The electrolysis of solutions of hydrochloric acid: E. **Doumer.** In the electrolysis of hydrochloric acid, oxygen always accompanies the chlorine, the proportion of oxygen to the hydrogen set free at the other electrode depending on the concentration, and increasing with the dilution of the acid. With an anode of silver or mercury, capable of combining with the chlorine, the proportion of oxygen for the same intensity of current is increased. The author concludes that the electrolysis of both the acid and the water takes place simultaneously. The amount of oxygen produced is not negligible, and must be taken into account in the determination of the transport factor of the ions and in the measurement of the conductivity of these solutions.—Lithium in radio-active minerals: Mlle. **Gleditsch.** Determinations of the copper, lithium, and the radio-activity compared with uranium have been made for the minerals thorite, Joachimsthal pitchblende, Colorado pitchblende, carnotite, chalcolite from Cornwall, and autunite. Lithium was found in all these minerals in amounts varying from 0·00017 per cent. to 0·03 per cent., and copper in all but autunite. These results prove that there is no simple relation between the amounts of copper and lithium in radio-active minerals.—A new method of estimating sulphur in organic substances: Isodore **Bay.** The substance is mixed with sodium carbonate and magnesia, and ignited in a current of oxygen. Test analyses are given showing the accuracy obtainable.—The separation of chloride and iodide of silver: H. **Baubigny.** A solution of ammonium carbonate can be used to effect the quantitative separation of silver iodide and chloride in the absence of bromide.—A method for the complete analysis of vegetable materials: J. M. **Albahary.**—The hydrolysis of perchloride of iron. The effect of the valency of the negative ions: G. **Malfitano** and L. **Michel.**—The reciprocal displacement of hydrocarbon groups in the Friedel and Crafts reaction: H. **Duval.**—The reducing properties of organo-metallic compounds: M. **Letellier.** By the action of ethyl-magnesium bromide upon ethyl oxypivalate, besides the glycol

$$CH_2(OH).C(CH_3)_2.C(OH)(C_2H_5)_2$$

expected, the compound $CH_2(OH).C(CH_3)_2.CH(OH).C_2H_5$ was obtained as a by-product. This is formed by the reduction of the ketone $CH_2(OH).C(CH_3)_2.CO.C_2H_5$, ethylene being evolved. Other instances of the reducing action of alkyl-magnesium compounds are cited.—The simultaneous production of the 1:6- and 2:7-dimethylanthracenes in the action of CH_2Cl_2, of $CHCl_3$, or of $C_2H_2Br_4$ upon toluene in the presence of aluminium chloride: James **Lavoux.**—The essence of *Tetranthera polyantha*, var. *citrata*: Eug. **Charabot** and G. **Laloue.** The essences from the bark, leaves, and fruits were examined. That from the bark contained citral, citronellal, and an alcohol, possibly geraniol; the essence from the leaves contained citral, cineol, and the same alcohol as the bark; the essence from the fruits consisted of citral, an ester, and possibly geraniol.—The possible presence of microscopic diamonds on the sea floor and in a specimen of vegetable earth: J. **Thoulet.** The mechanical analysis of a deposit obtained from the sea floor in the Bay of Biscay furnished some minute crystals many of the characters of which corresponded to those of the diamond, and similar crystals were obtained from a specimen of vegetable earth from the forest of Haye, near Liverdun. The quantities obtained were too small to admit of complete identification.—Contribution to the study of the alkaline rocks of Central Africa: L. **Gentil** and M. **Freydenberg.**—New observations on the anatomy and affinities of the Malpighiacea of Madagascar: Marcel **Dubard** and Paul **Dop.**—The formation of the notochord in some larvæ of the Tunicates: Louis **Roule.**—The mechanism of variations in height of the human body and some pathological variations: R. **Robinson.**—The statistical proof of Mendel's law: Angel **Gallardo.** An answer to some criticisms of Prof. K. Pearson.—The reproduction and the variations of development in *Glossina palpalis*: E. **Roubaud.**—The fixation of zinc by *Sterigmatocystic nigra*: M. **Janvillier.** A small proportion of zinc is favourable to the growth of this mould, and in solutions containing four parts per million of zinc or less the whole of the zinc present is fixed by the mould. With increasing proportions of zinc in the culture solution increasing amounts of zinc are found in the mycelium, but the whole of the zinc present is not taken up. The Sterigmatocystis is capable of fixing without injury 1/1100th of its weight of zinc.—The purgative action of phenolphthalein and its disodium derivative: C. **Fleig.**—The frequency of intestinal ulcerations in the course of an attack of influenza: Gabriel **Arthaud.**—Contribution to the study of the calorific radiation of the sun: G. **Millochau** and C. **Féry.**—The predominance of the erosion of the river Sarine on its right bank: Jean **Brunhes** and Cesare **Calciati.**

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 27.

ROYAL SOCIETY, at 4.30.—The Influence of Temperature on Phagocytosis: J. C. G. Ledingham.—The Glycogenic Changes in the Placenta and the Fœtus of the Pregnant Rabbit. A Contribution to the Chemistry of Growth: J. Lochhead and W. Cramer.—On the Maturation of the Ovum in the Guinea-pig: Prof. J. E. S. Moore and Miss F. Tozer.

ROYAL INSTITUTION, at 3.—Wood: its Botanical and Technical Aspects: Prof. W. Somerville.

SOCIETY OF DYERS AND COLOURISTS, at 8.—The Deterioration of Modern Dyed Leathers: M. C. Lamb.—A Note on the Germicidal Value of Petroleum Benzine: F. J. Farrell and F. Howles.

FRIDAY, FEBRUARY 28.

ROYAL INSTITUTION, at 9.—Explosive Combustion, with Special Reference to that of Hydrocarbons: Prof. W. A. Bone, F.R.S.

ROYAL SOCIETY OF ARTS, at 8.—The Removal of Dust and Fumes in Factories: Dr. J. S. Haldane, F.R.S.

PHYSICAL SOCIETY, at 5.—Contact Potential Differences Determined by Means of Null Solutions: S. W. J. Smith and H. Moss.—An Experimental Examination of Gibbs' Theory of Surface Tension as the Basis of Adsorption with an Application to the Theory of Dyeing: W. Lewis.

SATURDAY, FEBRUARY 29.

ESSEX FIELD CLUB (at the Essex Museum of Natural History, Stratford), at 6.—Artesian Wells on Fowlness Island, Essex, Ancient and Modern: W. H. Dalton.—On some Unexplored Fields of Essex Archæology: John French.—Note on a Post-Glacial Deposit on Mersea Island, Essex: W. H. Dalton.

MONDAY, MARCH 2.

VICTORIA INSTITUTE, at 4.30.—The Atlantic Islands, and Origin of Their Fauna: Prof. E. Hull, F.R.S.

ARISTOTELIAN SOCIETY, at 8.—The Idea of Totality: Dr. S. H. Hodgson.

TUESDAY, MARCH 3.

ROYAL INSTITUTION, at 3.—Membranes: Their Structure, Uses and Products: Prof. W. Stirling.

ZOOLOGICAL SOCIETY, at 8.30.—A Comparison of the Neotropical Species of Corallus, *C. cookii*, with *C. madagascariensis*; and on some Points in the Anatomy of *Corallus caninus*: F. E. Beddard, F.R.S.—On a Young Female Kordofan Giraffe: Dr. P. Chalmers Mitchell, F.R.S.—Description of a New Species of Monkey of the Genus Cercopithecus: R. I. Pocock.

CIVIL AND MECHANICAL ENGINEERS SOCIETY, at 8.—Notes on Engineering Works in Austria and Bosnia: A. S. E. Ackermann.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Further discussion*: The New York Rapid-transit Subway: W. B. Parsons.

WEDNESDAY, MARCH 4.

ROYAL SOCIETY OF ARTS, at 8.—Modern Dairy Practice: Loudon M· Douglas.

GEOLOGICAL SOCIETY, at 8.—On *Metriorhynchus brachyrhynchus* (Deslong.) from the Oxford Clay near Peterborough: E. Thurlow Leeds.—The High-Level Platforms of Bodmin Moor, and their Relation to the Deposits of Stream-tin and Wolfram: G. Barrow.

ENTOMOLOGICAL SOCIETY, at 8.—Descriptions of New Species of *Lepidoptera heterocera* from South-east Brazil: E. Dukinfield-Jones.

SOCIETY OF PUBLIC ANALYSTS, at 8.—The Volumetric Determination of Reducing Sugars: Part II. The Limits of Accuracy of the Method under Standard Conditions: A. R. Ling and G. Cecil Jones. Part III. The Influence of Cane Sugar: A. R. Ling and T. Rendle.—(1) The Composition of Milk; (2) The Nitrogen Factor for Casein: H. D. Richmond.

THURSDAY, MARCH 5.

ROYAL SOCIETY, at 4.30.—*Probable Papers*:—On the Atomic Weight of Radium: Dr. T. E. Thorpe, C.B., F.R.S.—On the Electrical Resistance of Moving Matter: Prof. F. T. Trouton, F.R.S., and A. O. Rankine.—On the Nature of the Streamers in the Electric Spark: Dr. S. R. Milner.—The Relation between Wind Velocity at 1000 Metres Altitude and the Surface Pressure Distribution: E. Gold.

ROYAL INSTITUTION, at 3.—Early British History and Epigraphy: Sir John Rhys.

CHEMICAL SOCIETY, at 8.30.—The Solubility of Iodine in Water: H. Hartley and N. P. Campbell.—Traces of a New Tin-group Element in Thorianite: Miss C. de B. Evans.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Fuse Phenomena: Prof. A. Schwartz and W. H. N. James.

LINNEAN SOCIETY, at 8.—On the Morphology of Stigmaria in Comparison with Recent Lycopodiaceæ: Prof. F. E. Weiss.—On *Trichoniscoides albidus* and *T. sarsi*: Alexander Patience.—*Exhibits*: Fruit Destroying Flies: W. W. Froggatt.—Mimicry in the Common Sole: Dr. A. T. Masterman.

FRIDAY, MARCH 6.

ROYAL INSTITUTION, at 9.—Recent Earthquakes: Prof. John Milne, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Surveying on Thunder Bay Branch of the Grand Trunk Pacific Railway, Canada: R. V. Morris.—British Practice in Railway Surveying: W. Graham.—Railway Surveying in Great Britain: W. C. Crawford.

SATURDAY, MARCH 7.

ROYAL INSTITUTION, at 3.—Electric Discharges through Gases: Prof. J. J. Thomson, F.R.S.

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